



# **MT1828**

## **CONVEYOR OVEN**

### **SERVICE AND REPAIR MANUAL**

#### **BLODGETT OVEN COMPANY**

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*CHAPTER 1*

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# ***INTRODUCTION***

## OVEN SPECIFICATIONS

### VENTILATION REQUIREMENTS

The hood should completely cover the unit with an overhang of at least 6" (15 cm) on all sides not adjacent to a wall. The distance from the floor to the lower edge of the hood should not exceed 7' (2.1 m). The ventilation system should replace 80% of the exhaust volume with fresh make up air. TABLE 1 should be used as a guideline.

	Single	Double	Triple
CFM	400-500	900-1000	1200-1500
M <sup>3</sup> /min	14 - 17	28-34	42-51

TABLE 1

### ELECTRICAL SPECIFICATIONS

*NOTE: Three Phase hookup is not permitted on gas models.*

#### Installations within the U.S.

The MT1828G requires a 15 Amp, 60HZ, 1 $\Phi$ , 208-240VAC, 4 wire service consisting of L1, L2, neutral and ground. See FIGURE 1. Use 90°C wire and size to National Electric or local codes.

The MT1828E is available in either 1 $\Phi$  or 3 $\Phi$  models. Single phase models require a 60Hz, 208/240VAC, 3 wire service consisting of L1, L2 and ground. Three phase models require a 60Hz, 208/240VAC, 4 wire service consisting of L1, L2, L3 and ground. See FIGURE 1. Wiring from the power source to any of these units must be a minimum of #8 AWG copper stranded wire or larger for 3 phase and #4 AWG for 1 phase.

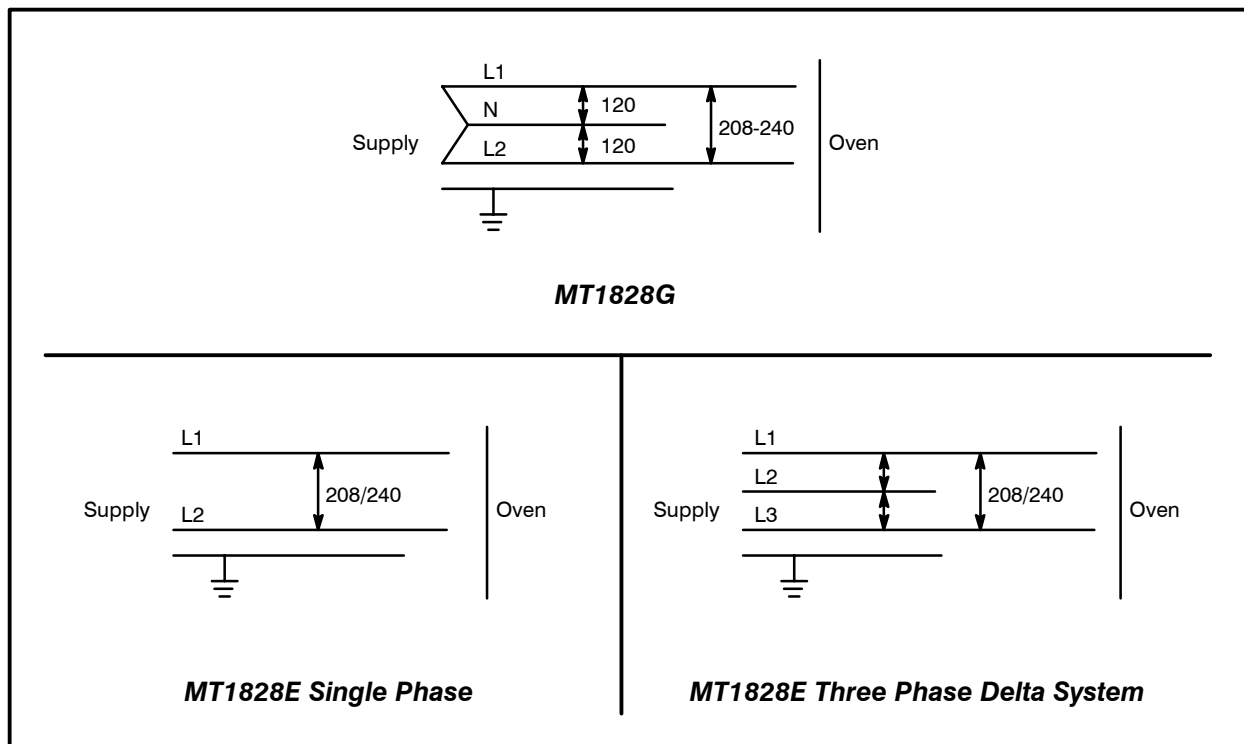


FIGURE 1

# MT1828

## Installations outside the U.S.

The MT1828G requires a 15 Amp, 50Hz, 1 $\Phi$ , 240 VAC, 3 wire service consisting of L1, neutral and ground. See FIGURE 2. Use 90°C wire and size wire according to local codes.

The MT1828E is available in either 1 $\Phi$  or 3 $\Phi$  models. Single phase models require a 50 Hz, 220/240VAC, 3 wire service consisting of L1, L2 and ground. Three phase models are available in either Delta or WYE configurations. Delta models require 50Hz, 208/240VAC, 4 wire service consisting of L1, L2, L3 and ground. WYE models require 50 Hz, 220/240 VAC, 5 wire service consisting of

L1, L2, L3, neutral and ground. See FIGURE 2. Use a minimum of 8.37 mm<sup>2</sup> copper stranded wire or larger for 3 phase and 21.15 mm<sup>2</sup> for 1 phase.

## CE approved installations

The MT1828G requires 15 Amp, 50Hz, 1 $\Phi$ , 230 VAC, 3 wire service consisting of L1, neutral and ground. Connect exhaust fan connector 1 and 2. See FIGURE 2. Use 90°C wire and size according to local codes.

The MT1828G requires 50 Hz, 3 $\Phi$ , 230VAC, 5 wire service consisting of L1, L2, L3, neutral and ground. See FIGURE 2. Use 90°C wire and size according to local codes.

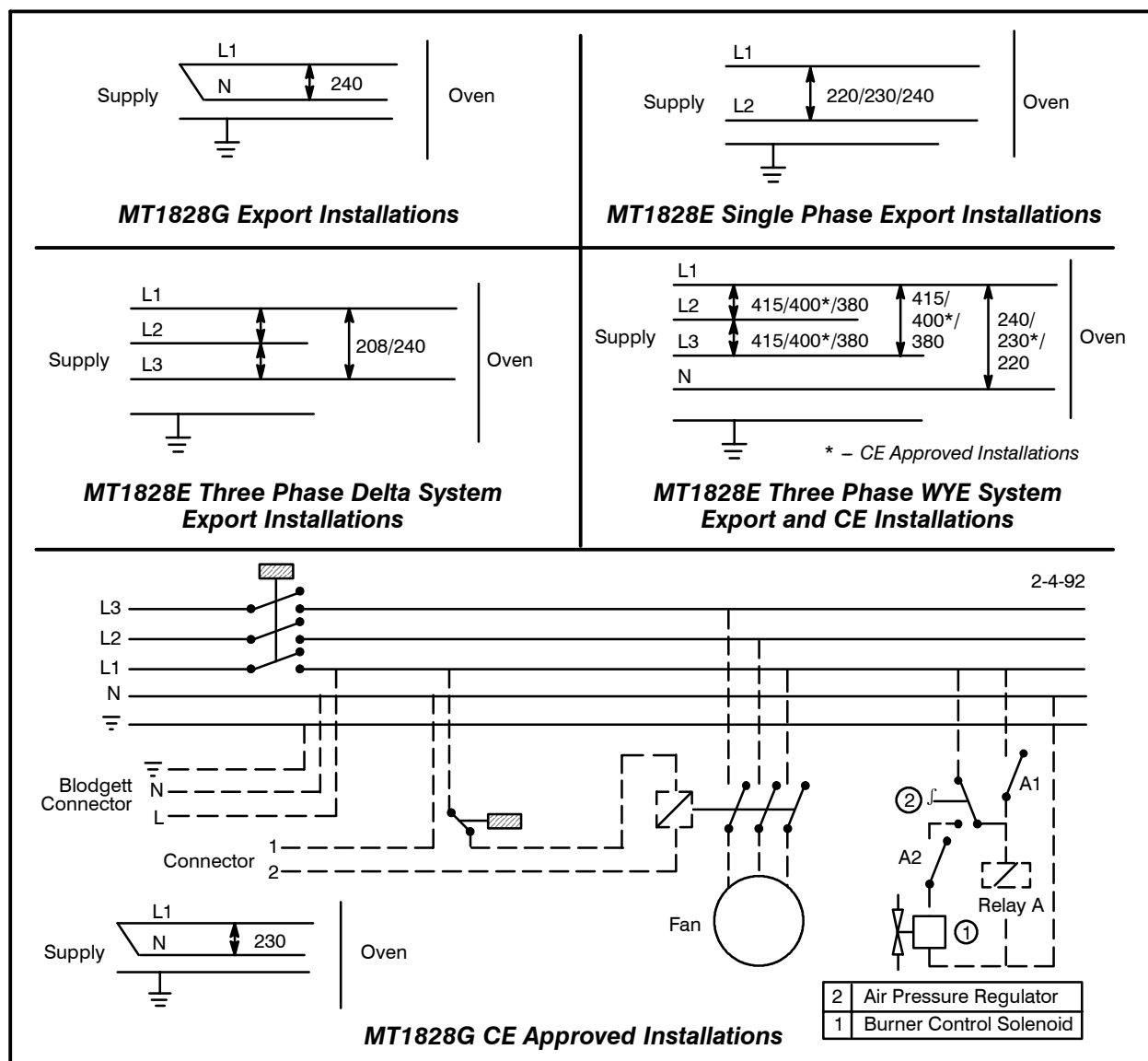


FIGURE 2

## GAS SPECIFICATIONS

### GAS CONNECTIONS

#### Domestic and General Export installations

The gas line should be large enough to accommodate the peak demand of all the gas appliances. TABLE 2 reflects a straight line, 50 foot run with no coupling restrictions and no other appliances drawing service. Gas line installations MUST conform to National Fuel Gas Code NFPA 54/ANSI Z223.1 Sec. 1.4 (Latest Edition). TABLE 2 should be used as a guideline only.

*NOTE: For any pipe runs over 50 feet (15 m), consult the factory.*

#### CE approved installations

1. Connect the oven to the gas line with the proper type of gas according to Local and National Installation Standards. See TABLE 2.

### GAS REQUIREMENTS

The firing rate for the MT1828G is 33,000 BTU/Hr. (9.7 kW/Hr.)

*NOTE: For natural gas meter sizing, consult your local gas company to ensure that your meter will provide the proper supply.*

#### Installations within the U.S.

1. Add the total BTU's/hr of all the gas appliances.
2. Convert BTU's to cubic ft/hr using the formula  
Cu Ft/Hr = 1000 BTU/Hr for natural gas.
3. Size the meter accordingly.

#### Installations outside the U.S.

1. Add the total M<sup>3</sup>/min of all the appliances.
2. Size the meter accordingly.

DOMESTIC AND GENERAL EXPORT						
	Natural Gas			Propane Gas		
Gas Line Sizing						
Single	3/4" line			3/4" line		
Double	3/4" line			3/4" line		
Triple	3/4" line			3/4" line		
Orifice Size	#34 MTD			#49 MTD		
Incoming Gas Pressure	W.C.	kPa	mbar	W.C.	kPa	mbar
Static	7"	1.74	17.4	12.5"	3.11	31.1
Operational	5.5"	1.36	13.7	11"	2.73	27.4
Manifold Gas Pressure	3.5"	0.87	9	10"	2.49	25
CE APPROVED UNITS						
Type of Gas	Inlet Pressure mbars	Burner Pressure mbars	Injector Diameter mm	Air Opening mm	Standard Delivery Value kW (H <sub>S</sub> )	
G25	25	8	3,1	22,3	9,8 Nat. Gas	
G20	20	8	2,7	22,3	9,8 Nat. Gas	
G20/G25	20/25	Totally Inscrewed Pressure Regulator	2,3	22,3	9,8 Nat. Gas	
G30	30/50	24	1,55	22,3	9,8 Butane	
G31	30/37/50	24	1,7	22,3	9,8 Propane	

TABLE 2

*CHAPTER 2*

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# ***OPERATION***

## COMPUTER CONTROLLER

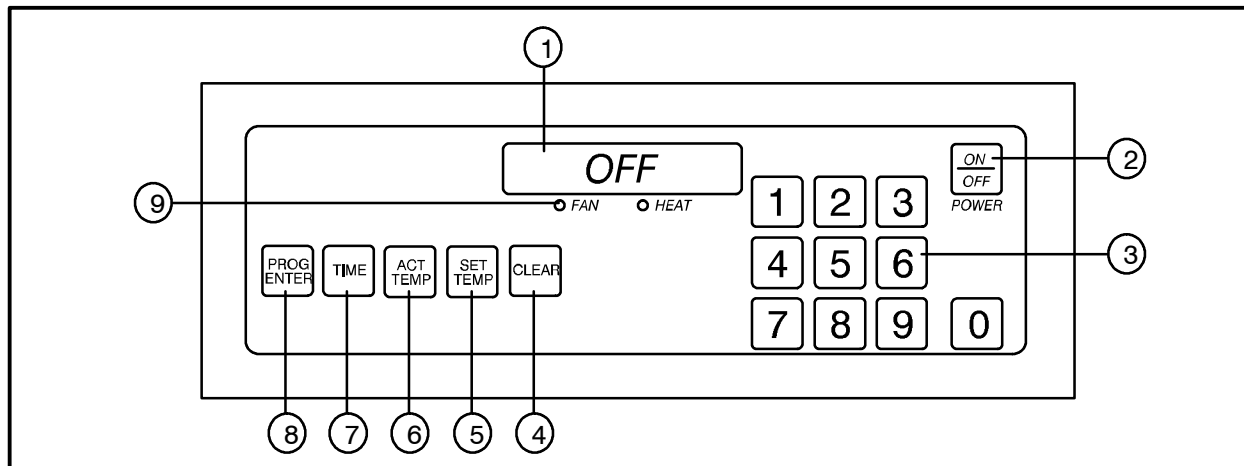


FIGURE 1

### CONTROL DESCRIPTION

1. **DIGITAL DISPLAY** – Displays the time, temperature and controller related information.
2. **OVEN ON/OFF** – Controls power to the oven.
3. **NUMERIC KEYS** – Used to enter numerical data in the programming mode.
4. **CLEAR KEY** – Used to clear the display if an error is made in the programming mode.
5. **SET TEMP KEY** – Used to view or program the temperature setpoint.
6. **ACT TEMP KEY** – Used to view the current oven temperature.
7. **TIME KEY** – Used to view or program the cook time.
8. **PROG/ENTER KEY** – Used to enter and exit the programming mode. Also used to lock in programmed settings.
9. **STATUS LAMPS** – When lit indicate that the fan or burners are operating.

This oven, supplied with remote control, is equipped with an emergency shut down switch. Should you need to stop the belt, fans, or heat press the emergency switch.

**Do not use the emergency switch as a GENERAL on/off switch!**

### CONTROL OPERATION

#### To turn the oven on:

1. Press and hold the ON/OFF key (2). The display reads *OFF* when the oven is idle.
2. The display flashes *WAIT • LOW • SET • TIME • mmss*.
3. The FAN and HEAT status lamps (9) light. The fans begin to run. The heat rises to the programmed temperature. The conveyor belt travels at the programmed speed.

#### To view the cook time setting:

1. Press the TIME key (7). The LED on the key lights and the display flashes *SET • TIME • mmss*.

#### To display the actual oven temperature:

1. Press the ACT TEMP key (6). The LED on the key lights and the display reads *ACTUAL • nnnn°F*.

#### To view the temperature set point:

1. Press the SET TEMP key (5). The LED on the key lights and the display flashes *SET • TEMP • nnnn°F*.

#### To turn the oven off:

1. Press the ON/OFF key (2). The blower motor(s) continue to run regardless of the controller status until the temperature drops below 180°F (82°C).



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## PROGRAMMING PROCEDURES

### Programming the Cook Time:

1. Press the PROGRAM/ENTER key (8).
2. Press the TIME key (7). The display reads *PROG-? • SET • TIME-? • \_ \_ \_ \_*.
3. Use the NUMERIC keys (3) to enter the desired cook time. The display will read the numbers as they are entered. If an error is made, press the CLEAR key (4) and re-enter the number.
4. Press the PROGRAM/ENTER key (8) a second time to lock-in the new time. The new cook time will be stored in the computer's memory.

### Programming the Temperature:

1. Press the PROGRAM/ENTER key (8).
2. Press the SET TEMP key (5). The display reads *PROG-? • SET • TEMP-? • \_ \_ \_ \_ °F*.
3. Use the NUMERIC keys (3) to enter the desired temperature set point. The control displays the numbers as they are entered. If an error is made, press the CLEAR key (4) and re-enter the number.
4. Press the PROGRAM/ENTER key (8) a second time to lock-in the new temperature. The new temperature setpoint will be stored in the computer's memory.

### Operation at the Programmed Settings:

1. Press and hold the ON/OFF key (2).
2. The FAN and HEAT status lamps (9) light. The fans begin to run. The heat rises to the temperature setting stored in the computer's memory. The conveyor belt begins to travel at the timed speed stored in memory.
3. The display will flash *WAIT • LOW • SET • TIME • mmss* until the programmed bake temperature is reached. The HEAT lamp (9) will remain lit until the oven reaches the temperature set point.
4. The display reads *READY* and the HEAT lamp (9) goes out.
5. The oven is now ready to accept product.
6. Press and hold the ON/OFF key (2) to turn the oven off. The fans continue to run while the oven cools to a safe temperature.

## DISPLAY INFORMATION

- *WAIT • LOW* – indicates that the present oven temperature is lower than the set point temperature. When the oven reaches the set point temperature the display changes to *READY*.
- *READY* – indicates that the oven is ready to accept product.
- *SET • TIME • mmss* – indicates the current cook time setting.
- *HIGH • TIME* – indicates that the temperature is well above the set point. This usually occurs when moving from a higher to a lower temperature. Wait until the display reads ready before loading product.
- *HIGH • TEMP • LIMIT* – indicates that the oven temperature exceeds the high limit from the 2nd level program. The Over Temperature Alarm buzzer will sound. Shut the oven off and wait for the unit to cool down.
- *MTR • SPD* – indicates speed of the motor does not match the set point.
- *MOTOR* – indicates the computer is not receiving the signal back from the pickup.
- *HI • TEMP • MOTOR – N.A.*
- *PROBE • OPEN • PROBE • SHORT* – indicates that the temperature sensor has failed. The Alarm buzzer sounds. Shut the oven off and contact a service representative.

## SEQUENCE OF OPERATION

### MT1828G DOMESTIC AND GENERAL EXPORT OVENS INTERNAL MOUNT – M7296 REV B

#### COMPONENT REFERENCE

*NOTE: Refer to FIGURE 2 for component locations.*

1. BLOWER RELAY
2. BELT STOP RELAY
3. HEAT RELAY
4. MOTOR CONTACTOR
5. SINGLE POLE DOUBLE THROW THERMAL SWITCH
6. MOTOR CONTROL BOARD
7. SINGLE POLE SINGLE THROW THERMAL SWITCH
8. RESETABLE HI LIMIT
9. 115/24 VOLT TRANSFORMER
10. FLAME BLOWER
11. IGNITION CONTROL MODULE
12. COOKING COMPUTER
13. PRESSURE SWITCH
14. H.S.I.
15. BURNER VALVE
16. PROOF OF FLAME ROD
17. SINGLE POLE DOUBLE THROW THERMAL SWITCH
18. CONVECTION BLOWERS
19. COOLING FANS

#### OPERATION

1. Apply power to the oven. Program time and temperature into the computer (12). The blower relay (1), belt stop relay (2) and heat relay (3) close.
2. When the blower relay (1) closes, 110 V.A.C. are sent to the coil of the motor contactor (4) starting the convection blowers (18) and N.C.

terminal of a single pole double throw thermal switch (5).

3. When the belt stop relay (2) closes, 110 V.A.C. are sent to the motor control board (6) and the single pole single throw thermal switch (7). If this switch is closed, power goes to the resettable hi limit switch (8).
4. If the resettable hi limit switch is closed power goes to the 115/24 volt transformer (9) located in the box mounted on the flame blower (10). The flame blower starts.
5. The secondary side of the transformer (9) sends 24 volts to L1 of the ignition control module (11) and one side of the heat relay (3). If the computer (12) closes the heat relay, the 24 volts will go to the pressure switch (13).
6. If the pressure switch is closed, a circuit will be completed back to the ignition module (11).
7. The ignition module initiates its firing sequence by sending power to the H.S.I. (14). After a warm up period both solenoids on the burner valve (15) open allowing gas to enter for ignition. If no flame is sensed by the proof of flame rod (16) the system shuts down.

*NOTE: Some ignition control modules may try to refire up to 3 times. However, there will be a longer warm up period between each attempt at ignition.*

8. The thermal switches (5 and 17) toggle from common to N.O. only when they reach the temperature stated on the back of the switch.
9. The convection blowers (18) receive their power from the motor contactor (4) only.
10. The cooling fans (19) come on only when the motor contactor (4) is energized or if the thermal switches (5 and 17) have toggled.



## MT1828G DOMESTIC AND GENERAL EXPORT OVENS EXTERNAL MOUNT – M9776 REV B

### COMPONENT REFERENCE

*NOTE: Refer to FIGURE 2 for component locations.*

1. BLOWER RELAY
2. BELT STOP RELAY
3. HEAT RELAY
4. MOTOR CONTACTOR
5. SINGLE POLE DOUBLE THROW THERMAL SWITCH
6. MOTOR CONTROL BOARD
7. SINGLE POLE SINGLE THROW THERMAL SWITCH
8. RESETABLE HI LIMIT
9. 115/24 VOLT TRANSFORMER
10. FLAME BLOWER
11. IGNITION CONTROL MODULE
12. COOKING COMPUTER
13. PRESSURE SWITCH
14. H.S.I.
15. BURNER VALVE
16. PROOF OF FLAME ROD
17. SINGLE POLE DOUBLE THROW THERMAL SWITCH
18. CONVECTION BLOWERS
19. COOLING FANS

### OPERATION

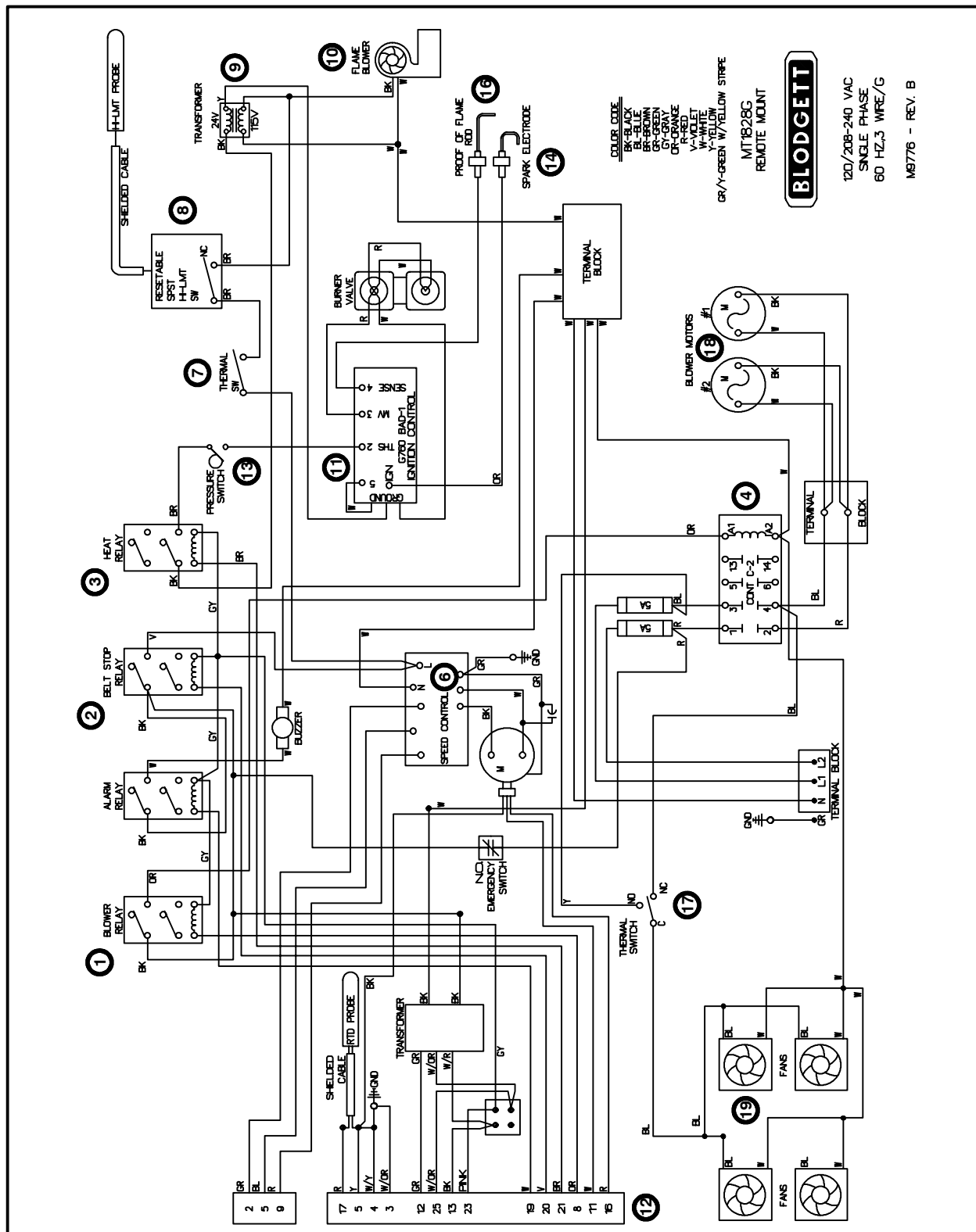
1. Apply power to the oven. Program time and temperature into the computer (12). The blower relay (1), belt stop relay (2) and heat relay (3) close.
2. When the blower relay (1) closes, 110 V.A.C. are sent to the coil of the motor contactor (4) starting the convection blowers (18). When the

motor contactor closes, power is also applied to the NIC terminal of a single pole double throw thermal switch (5).

3. When the belt stop relay (2) closes, 110 V.A.C. are sent to the motor control board (6) and a single pole single throw thermal switch (7). If this switch is closed, power goes to the resettable hi limit switch (8).
4. If the resettable hi limit switch is closed power goes to the 115/24 volt transformer (9) located in the box mounted on the flame blower (10). The flame blower starts.
5. The secondary side of the transformer (9) sends 24 volts to one side of the heat relay (3). If the computer (12) closes the heat relay, the 24 volts will go to the pressure switch (13).
6. If the pressure switch is closed, a circuit will be completed to the ignition module (11).
7. The ignition module initiates its firing sequence by starting to spark at the spark electrode (14) and opening both solenoid valves on the burner valve (15) allowing gas to enter for ignition. If no flame is sensed by the proof of flame rod (16) the system shuts down.

*NOTE: Some ignition control modules may try to refire up to 3 times. However, there will be a longer interpurge period between each attempt at ignition.*

8. The thermal switch (17) toggles from common to N.O. only when it reaches the temperature stated on the back of the switch.
9. The convection blowers (18) receive their power from the motor contactor (4) only.
10. The cooling fans (19) come on only when the motor contactor (4) is energized or if the thermal switch (17) has toggled.



*FIGURE 3*

## MT1828E DOMESTIC AND GENERAL EXPORT OVENS – M6314 REV C

### COMPONENT REFERENCE

### OPERATION

*NOTE: Refer to FIGURE 4 for component locations.*

1. COMPUTER
2. BLOWER RELAY
3. BELT STOP RELAY
4. HEAT RELAY
5. 208/120 STEP DOWN TRANSFORMER
6. MOTOR CONTACTOR
7. SINGLE POLE DOUBLE THROW THERMAL SWITCH
8. CONVECTION FANS
9. COOLING FANS
10. SPEED CONTROL BOARD
11. D.C. MOTOR
12. SINGLE POLE SINGLE THROW THERMAL SWITCH
13. RESETABLE HI LIMIT
14. CONTACTOR
15. ELEMENTS

1. Apply power to the oven. Program the time and temperature into the computer (1). The blower relay (2), belt stop relay (3) and heat relay (4) are energized.
2. If the contacts in the blower relay close the 110 V.A.C. supplied from the 240/120 step down transformer (5) will go to the coil of the motor contactor (6) and the N.C. terminals of two single pole double throw thermal switches (7). These switches toggle when ambient air passing the face of the switch exceeds the rating on the back of the switch.
3. If the motor contactor (6) and the thermal switches (7) are closed the convection fans (8) and cooling fans (9) will start.
4. The belt stop relay (3) should be closed sending 110 V.A.C. to the speed control board (10).
5. If the speed control board is working it sends out a variable amount of D.C. voltage to the D.C. motor (11). The voltage can vary from 20 to 130 VDC depending on the amount of time programmed into the computer (1).
6. The heat relay (4) closes with a call for heat sending power to a single pole single throw thermal switch (12). This switch acts as a temperature limiting device for the controls and opens if the ambient air around the control exceeds the rating on the back of the switch.
7. If the switch is closed, 110 VAC goes to the resetable hi limit (13). This switch acts as an oven hi limit and opens if the temperature in the oven exceeds 630°F (333°C).
8. If the resetable high limit switch is closed the power will go to one side of the contactor coil (14). This contactor powers the elements (15).
9. When the motor contactor (6) closes the convection fans (8) start. If the thermal switches are closed between the N.C. and C. terminals the cooling fans (9) will start.

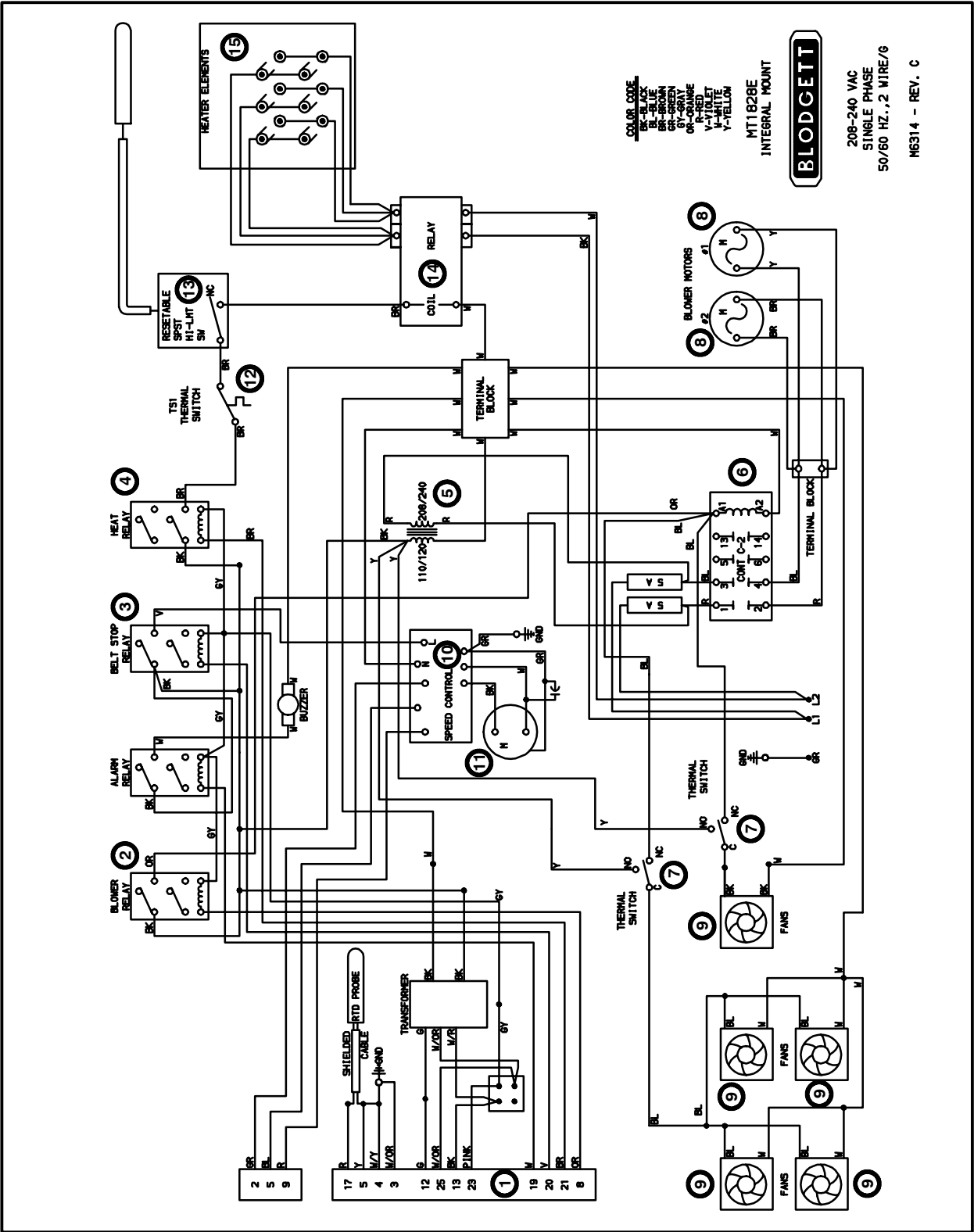


FIGURE 4

## MT1828G CE OVENS – M6462 REV B

### COMPONENT REFERENCE

*NOTE: Refer to FIGURE 5 for component locations.*

1. COMPUTER
2. MAIN CONTROL RELAY
3. BLOWER RELAY
4. BURNER VALVE RELAY
5. MOTOR CONTACTOR
6. SINGLE POLE DOUBLE THROW THERMAL SWITCH
7. CONTROL COMPARTMENT COOLING FAN
8. SPEED CONTROL BOARD
9. RESETABLE HI LIMIT
10. CONVECTION BLOWER PRESSURE SWITCH
11. CONVECTION BLOWERS
12. FLAME BLOWER
13. BURNER PRESSURE SWITCH
14. LATCHING RELAY
15. PURGE TIMER
16. SINGLE POLE SINGLE THROW RELAY
17. SINGLE POLE SINGLE THERMAL SWITCH
18. IGNITION CONTROL MODULE
19. H.S.I.
20. DUAL SOLENOID GAS VALVE
21. PROOF OF FLAME ROD
22. SINGLE POLE DOUBLE THROW SWITCH
23. COOLING FANS
24. D.C. DRIVE MOTOR

### OPERATION

1. Apply power to the oven. Program time and temperature into the computer (1). The main control relay (2) blower relay (3) and burner valve relay (4) will energize.
2. The blower relay (3) sends power to the coil of the motor contactor (5) and the N.C. terminal of a single pole double throw thermal switch (6). This switch starts the control compartment cooling fan (7). The motor contactor energizes the convection blowers (11) and the N.C. terminal of another thermal switch (22).
3. The main control relay (2) sends 230 VAC to the speed control board (8) and the resetable hi limit (9).
4. If the hi limit (9) is closed, power goes to the convection blower pressure switch (10). This switch closes when the convection blowers (11) are operating. If the switch is closed, power goes to the flame blower (12), the common terminal of the burner pressure switch (13) and terminal #7 of the latching relay (14).
5. If the burner pressure switch (13) is closed between COM and N.C., power goes to #4 and the coil of the latching relay (14). This closes the relay from #4 to #7 and #6 to #9. The relay remains latched due to the power on #7 running through #4 to the coil.
6. When the flame blower (12) reaches speed, a differential in pressure is created in the burner pressure switch (13). The switch toggles from COM and N.C. to COM and N.O. This supplies power to #9 of the latching relay (14) which should be closed through to #6, sending power to a purge timer (15).
7. When the purge timer (15) times out it sends power to the coil of a single pole single throw relay (16).
8. If the burner valve relay (4) is closed, power goes to a single pole single throw thermal switch (17). This switch acts as a control hi limit. It opens if the ambient air temperature reaches the range on the back of the switch.
9. If the switch is closed, power goes through the closed set of contacts in the relay (16) to terminal #17 of the ignition module (18).
10. After a warmup period for the H.S.I. (19), the ignition control module (18) powers up the dual solenoid gas valve (20). If the proof of flame rod (21) does not sense a flame in 1 second, the ignition control module shuts the system down.
11. The single pole double throw switch (22) gets its power from the motor contactor (5). This switch is closed between the common and N.C. terminals, powering the cooling fans (23). The switch toggles if the ambient air passing the facing of the switch exceeds the number on the back of the switch.
12. The D.C. drive motor (24) gets voltage from the speed control board (8). The speed of the drive motor varies with the time programmed into the computer. The voltage range for this board is from 20 to 180 V.D.C. measured at A1 and A2 of the speed control board (8).



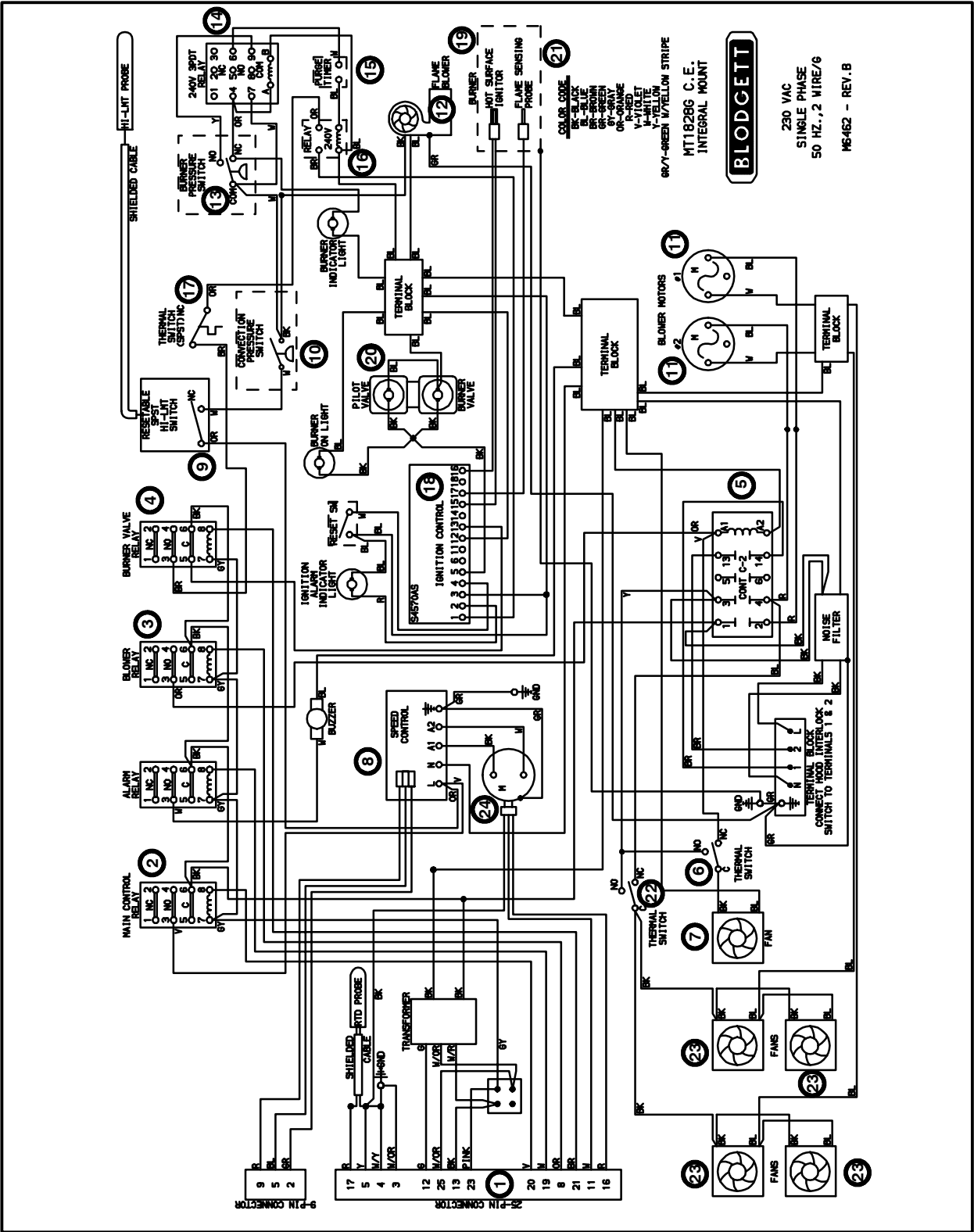


FIGURE 5

## MT1828E CE OVENS – M6453 REV A

### COMPONENT REFERENCE

*NOTE: Refer to FIGURE 6 for component locations.*

1. COOKING COMPUTER
2. BLOWER RELAY
3. BELT STOP RELAY
4. HEAT RELAY
5. 240/120 STEP DOWN TRANSFORMER
6. MOTOR CONTACTOR
7. SINGLE POLE DOUBLE THROW THERMAL SWITCHES
8. COOLING FANS
9. SPEED CONTROL BOARD
10. D.C. DRIVE MOTOR
11. SINGLE POLE SINGLE THROW THERMAL SWITCH
12. RESETABLE HI LIMIT
13. ELEMENT CONTACTOR
14. ELEMENTS
15. CONVECTION MOTORS

### OPERATION

1. Apply power to the oven. Program the time and temperature into the computer (1). The blower relay (2), belt stop relay (3) and heat relay (4) are energized.
2. Voltage is applied to the contacts of these relays by a 240/120 volt step down transformer (5).
3. If the blower relay (2) is closed voltage is applied to the coil of the motor contactor (6). The contactor is energized and voltage is supplied to the normally closed terminals of the single pole double throw thermal switch (7).
4. If both of these switches are closed between C and N.C. All five cooling fans start. The switches toggle from C and N.C. to C. and N.O. when the temperature of the air passing them exceeds the rating on the back of the switches.
5. If the belt stop relay (3) is closed, power goes to the speed control board (9). The board sends D.C. voltage to the D.C. drive motor (10). The voltage output varies with the time programmed into the computer (1).
6. If the heat relay (4) is closed, power goes to a single pole single throw thermal switch (11). If this switch is closed, power goes to a manual resetable hi limit (12). If this switch is closed, power goes to the coil of the hot air element contactor (13). The element is energized and power is sent to the heating elements (14).
7. The thermal switches (7 and 11) react to ambient air moving across the face of the switch. They react only when the temperature exceeds the rating on the back of the switch. The single pole double throw thermal switch (7) toggles when the temperature rises. The single pole single throw thermal switch (11) opens when the temperature rises.
8. The manual hi limit (12) opens when the temperature inside the oven cavity exceeds 690°F (366°C).
9. The convection motors (15) are powered when the motor contactor (6) is energized.

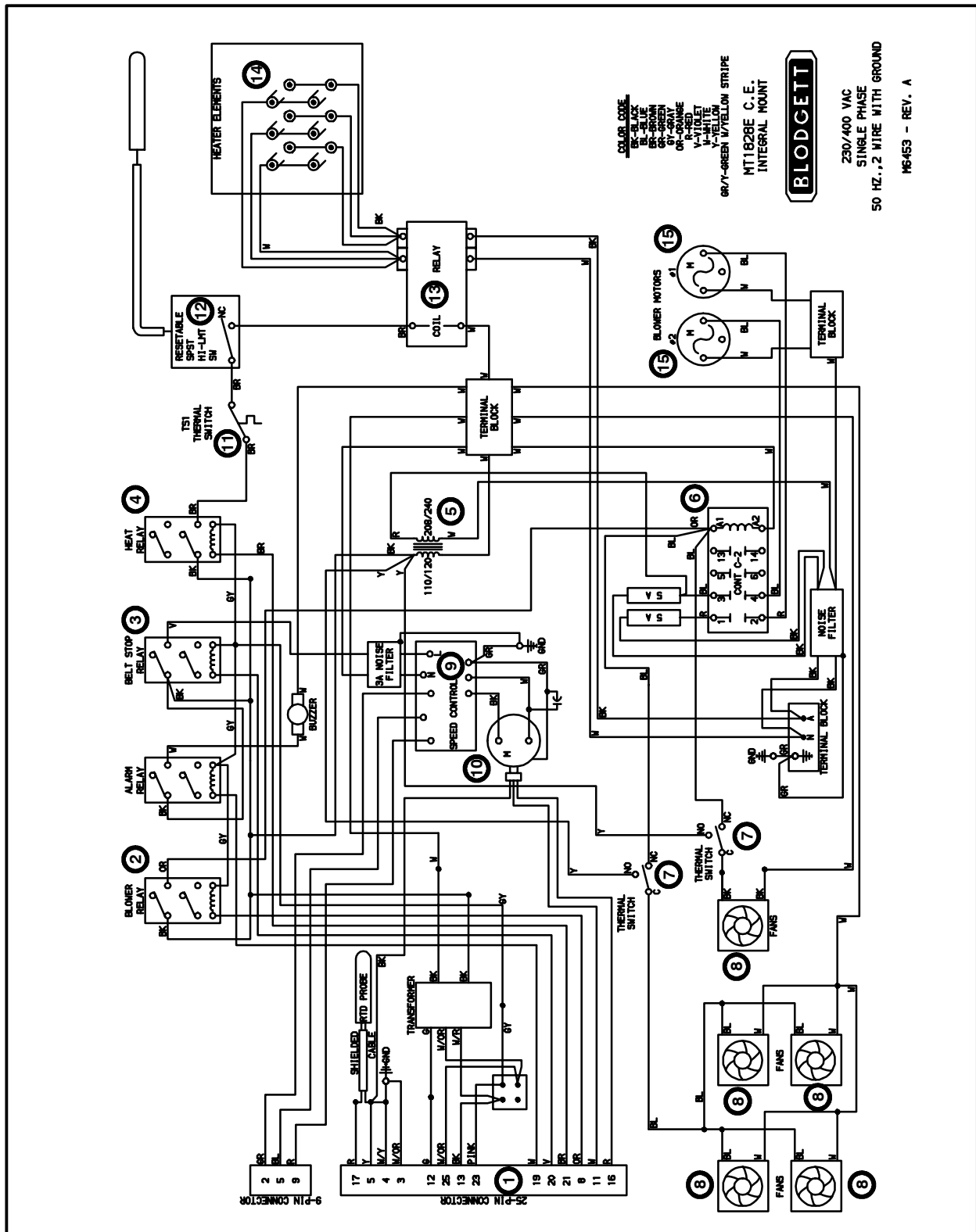


FIGURE 6

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## *CHAPTER 3*

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# ***CALIBRATION AND ADJUSTMENT***

## CONVECTION BLOWER MOTORS

### TO CHECK MOTOR ROTATION

1. Remove the back of the oven body and verify proper motor rotation. (See FIGURE 1)

For motor placement, the direction of rotation is viewed from the oven's rear, working from left to right, beginning at the control box. In most cases, the motor direction is referenced to the end of the shaft (EOS). However, due to the vertical positioning of the motors in Mastertherm ovens, it is more instructive to reference the end of the motor (EOM) as looking from the rear of the oven. In FIGURE 1 all directions are taken from EOM. The correct rotation amperage draw is approximately .6 amp cold/.3 amp hot. If the measured amperage is less than .3 amp cold/.1 amp hot, check for proper motor rotation direction.

### TO CHECK LOW-LIMIT

1. Turn the oven on and let it heat up to approximately 200°F (93°C).
2. Shut the oven off. The blowers should come back on in several seconds.
3. Wait for the blowers to shut off.
4. Once the blowers are off, turn the oven back on. Press the "ACT TEMP" key to verify that the blowers shut off between 135°F (57°C) and 170°F (77°C). If the blowers do not shut off refer to the Troubleshooting section page 5–6.

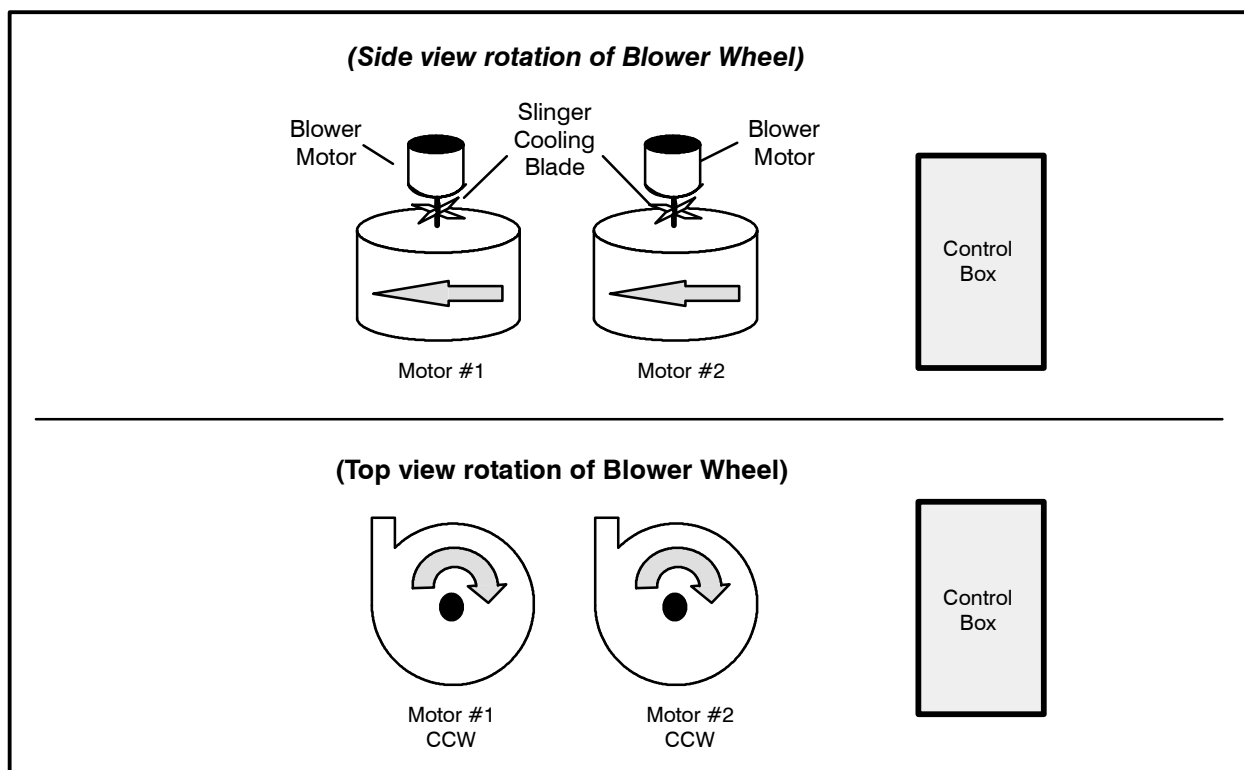


FIGURE 1

### REGULATED GAS PRESSURE

1. Let the oven run up to 510°F (266°C). Program the belt for 7 minutes. You may now verify the operational and regulated gas pressures.

Incoming static gas pressure to the unit, with all the gas appliances drawing from the supply, should be a minimum of 5.5" W.C. (13.7 mbar) for natural gas and 11" W.C. (28 mbar) for propane gas. The manifold pressure, if measured after the regulator located inside the control box, must be 3.5" W.C. (9 mbar) for natural gas and 10" W.C. (25 mbar) for propane gas.

The pressure can be checked at the tap on the dual regulated gas valve. If pressure adjustments are needed, turn the adjusting screw located under a screw cap on the left front side of the dual regulated valve. Adjust the gas pressure by turning the screw clockwise to raise the gas pressure and counter-clockwise to lower the gas pressure. Be sure to reinstall the screw cap; should the diaphragm rupture this cap acts as a flow limiter

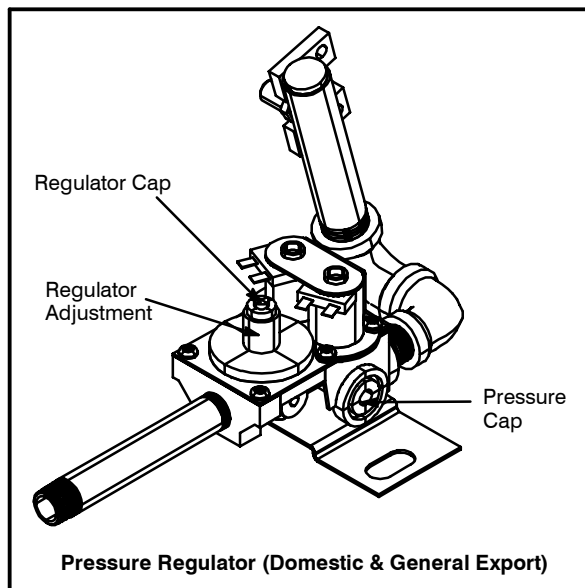


FIGURE 2

### Setting Equipment for Other Types of Gas – CE Models

1. Shut off the gas valve and turn off the operating switch.
2. Dismantle the gas block by means of couplings.
3. Replace the gas valve.
4. Dismantle the main burner and replace the injector.
5. Unscrew 4 screws from the burner mounting plate. Remove the burner from the combustion chamber.
6. Install the burner and gas block.
7. Check for leakage and possible loose electrical connections.
8. Adjust gas pressure if necessary, See FIGURE 3.

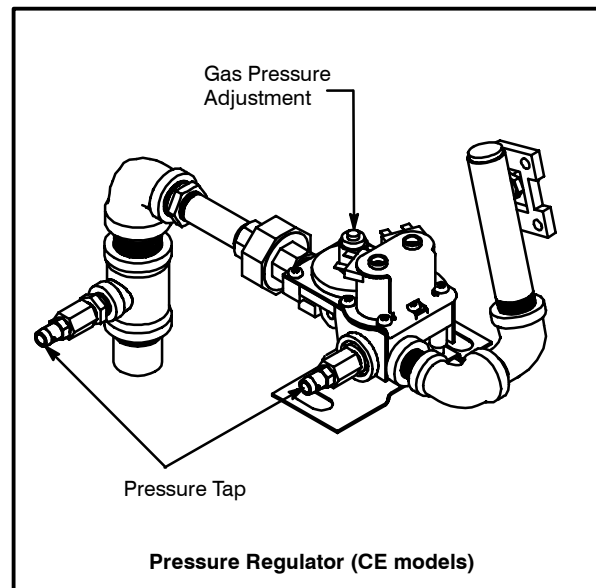


FIGURE 3

## COMPUTER CONTROL CONFIGURATION

### INITIATING ACCESS MODE

The Cooking Computer provides a special Access Mode for setting and displaying certain computer special functions. To initiate the Access Mode place the control in the OFF state, (OFF is shown in the display when power is first applied to the control). Press the following sequence of keys to set the control to Access Mode: CLEAR 1 2 3 4 5 6 ENTER. The display will show ACCESS.

### CONFIGURATION

When the controller is in the "ACCESS" mode, press the following buttons: CLEAR 1 1 1 ENTER. With the exception of the positive and negative offsets, to be addressed later, all display data should correspond to the entries in the chart below. If the data does not match the chart, it should be changed accordingly. When the correct data is displayed press the PROG/ENTER key, the display will cycle on to the next screen. If a step is missed, press the CLEAR button to backup.



















DISPLAY	ACTION TAKEN	DISPLAY	ACTION TAKEN
F/CMODE?	Press 	T $\downarrow$ F° (°C)	Press  again or hit any number and it will change.
POS OFFSET?	Press 	0° (0°)	Press 
NEG OFFSET?	Press 	0° (0°)	Press 
MAX-T ENTRY?	Press 	600° (315°)	Press  or change then again.
MAX-T LIMIT?	Press 	625° (330°)	Press 
READY BAND?	Press 	10	Press 
MIN-HT ON?	Press 	60	Press 
DISPLAY INTEG?	Press 	30	Press 
T-CTRL INTEG?	Press 	10	Press 

TABLE 1



## CALIBRATION AND ADJUSTMENT

### Boost Option – (versions 2.00 or 3.00)

When the controller is in the “ACCESS” mode, press the following buttons: CLEAR 2 1 2 ENTER to enter the boost option.







DISPLAY	ACTION TAKEN	DISPLAY	ACTION TAKEN
BOOST / MODE-? (Flash alternately)	Press  	OPT-1 or OPT-2	Press any numeric key to toggle between OPT-1 and OPT-2
Select OPT-1 to turn off boost mode.			
OPT-1	Press  	DONE SAVE EXIT	Press  

TABLE 2

### EXITING THE ACCESS MODE

After pressing PROG/ENTER the last time, the display will show “EXIT” then beep and return to the “ACCESS” mode. Pressing and holding the ON/OFF key will turn the oven on. A new time and temperature must be entered upon exiting the “ACCESS” mode since the oven will automatically default to 0. The oven will not fire until both time and temperature are entered.

### Firmware Model Version Display from Access

Password: CLEAR 1 2 3 ENTER

**MODEL** - Computer Model Number – 6028  
(Blodgett Conveyor Oven With Speed Control)

**SW-VER** - Firmware version number. V-xyxy xx =  
major version, yy = minor version

**DATE-?** -Firmware release date

**CHKSUM** - ROM checksum stored in PROM. xxxx  
- Value is display in hexadecimal format.

## TEMPERATURE CALIBRATION

### TO ENTER THE CALIBRATION MODE

1. Press the ON/OFF key until *OFF* is displayed.
2. Press CLEAR 1 2 3 4 5 6 ENTER to enter the access mode. The display reads *ACCESS*.
3. Press CLEAR ACT\_TEMP ACT\_TEMP ACT\_TEMP ENTER to access the Temperature Calibration mode.
4. On open loop models disconnect the white wire from the D.C. motor. Secure so the wire will not ground against any part of the oven. This will disable the conveyor.

*NOTE: Disregard the controller display. The only numbers of concern are the pyrometer reading and the temperature set point.*

### TO CALIBRATE THE OVEN TEMPERATURE

During operation, the temperature control is based on the measured temperature and the temperature offset which is programmed into the control. If the temperature measured in the center of the oven is below the oven setpoint a positive offset is needed. If the temperature measured in the center of the oven is above the oven setpoint a negative offset is needed.

*NOTE: In the calibration mode the display gives the current measured temperature only.*

#### To view the current temperature setpoint:

1. Press the SET\_TEMP key.

#### To change the temperature setpoint :

1. Press PROG/ENTER SET\_TEMP.
2. Enter the desired setpoint.
3. Press the PROG/ENTER key.

#### To program the temperature offset:

To change the temperature calibration an offset, positive or negative, must be programmed.

1. Press PROG/ENTER followed by ACT\_TEMP. The display flashes either *POS \* OFFSET* or *NEG \* OFFSET*

*NOTE: POS OFFSET is displayed if a value has been programmed in for a positive offset. NEG OFFSET is displayed if a value has been programmed for a negative offset. The only time both will be displayed is if a value of 0 has been entered for both.*

2. Enter a value for the desired offset. The display flashes *DISPLAY \* INTEG?*.
3. Press the PROG/ENTER key. The default value of 30 will be displayed.
4. Press the PROG/ENTER key. The display will flash *T-CTRL \* INTEG?*.
5. Press the PROG/ENTER key. The default value of 10 will be displayed.
6. Press the PROG/ENTER key.

The control will now resume using the new parameters.

Verify the temperature calibration once the unit has cycled for 5 minutes with the new settings. Repeat calibration using a new offset value if necessary.

### TO EXIT THE CALIBRATION MODE

1. Press the CLEAR key twice.
2. The display flashes *REBOOT* then displays the set time and temperature. You must re-enter a temperature for the oven to start heating again.
  - A.) Press PROG/ENTER SET\_TEMP
  - B.) Enter the desired temperature.
  - C.) Press the PROG/ENTER key. The heat light turns on and the burner begins to cycle at set point.

## BELT SPEED CALIBRATION

### CLOSED LOOP SYSTEM

#### To enter the calibration mode:

1. Press the ON/OFF key until *OFF* is displayed.
2. Press CLEAR 1 2 3 4 5 6 ENTER to enter the Access mode. The display reads *ACCESS*.
3. Press CLEAR TIME TIME TIME ENTER to access the Belt Speed Calibration mode. The display flashes *INIT*.

#### Belt speed calibration:

1. OVEN LENGTH – Set the length of the conveyor belt using the information from TABLE 3.
2. MOTOR RATIO – Set the motor gear ratio from the information from TABLE 3.
3. SHAFT TEETH – Set the shaft teeth number from the information from TABLE 3.
4. MOTOR TEETH – Set the motor teeth number from the information from TABLE 3.
5. BELT RADIUS – Set the belt radius from the information from TABLE 3.

*NOTE: The values given are estimates. If you reenter the calibration mode after setting the belt speed, the belt radius may differ from the table.*

6. The display gives a four digit value followed by the letter K. Press ENTER twice to verify the belt time.

#### Belt speed verification:

1. ENTER TEST TIME – Enter a test time to verify the belt speed. The default setting is 7 minutes.
2. WAIT – 1 second delay before the belt moves.

3. ENTER ACTUAL TIME – Place an object on the belt. Note the time from entrance to exit. Enter the actual measured time.
4. ENTER TEST TIME – If the actual measured time is not within 5 seconds of the test time, repeat the belt verification test to obtain better accuracy. If the actual measured time is acceptable, press the CLEAR key to continue the belt speed calibration.
5. MAX/MIN CALC TIME – The control sets the fastest and slowest cook time the user can program. This requires a 1 minute delay in the calibration process.

*NOTE: If the control cannot read the shaft encoder the display reads ERROR then ABORT before exiting belt calibration. Verify the connection of the encoder Restart the belt speed calibration.*

6. The display flashes *MIN SET TIME?* Press the PROG/ENTER key to display the calculated minimum set time. Press the PROG/ENTER key to accept this value or enter a new time with a value higher than the default. Press PROG/ENTER again to accept.
7. The display flashes *MAX SET TIME?* Press the PROG/ENTER key to display the calculated maximum set time. Press the PROG/ENTER key to accept this value or enter a new time with a value lower than the default. Press PROG/ENTER again to accept.
8. The display reads *DONE*.

#### To save the new belt speed:

1. Press ENTER to save the belt speed calibration program in the control's memory.

Oven Type	Oven Length	Motor Ratio	Shaft Teeth	Motor Teeth	Belt Radius
MT3870	70	600	15	12	8,712
MT3855	55	600	15	12	8,712
MT3270	70	600	15	12	8,712
MT3240	40	600	15	12	8,893
MT2136	36	600	15	12	8,712
MT1828	28	600	24	24	7,209

TABLE 3

## OPEN LOOP SYSTEM

### To enter the calibration mode:

1. Press the ON/OFF key until *OFF* is displayed.
2. Press CLEAR 1 2 3 4 5 6 ENTER to enter the Access mode. The display reads *ACCESS*.
3. Press CLEAR TIME TIME TIME ENTER to access the Belt Speed Calibration mode. The display flashes *INIT*.

### To calibrate the belt speed:

1. The display reads *BELT SIZE-?*. Enter the length of the conveyor belt, see TABLE 4. Press the PROG/ENTER key.
2. The display reads *STEP-1*. The controller is in Step 1 of the calibration procedure: maximum belt speed. The motor control is automatically set to its maximum output. Place an object on the belt and note the time from entrance to exit.

*NOTE: Be certain to measure either the leading edge in and out or the trailing edge in and out. Do not use the leading edge in and the trailing edge out.*

A.) The display reads *STEP-1TIME-?*. Enter the time measured in STEP-1. Min: 0 Max: 59:59 (min:sec). Press the PROG/ENTER key. Measured voltage at A1 and A2 should be 130 VDC.

B.) The display reads *STEP-1DIST-?*. Enter the belt length, see TABLE 4. Press the PROG/ENTER key.

3. The display reads *STEP-2*. The controller is in Step 2 of the calibration procedure: minimum belt speed. The motor control is automatically set to its minimum output.

The belt will travel very slowly during this part of the calibration procedure. To minimize the

time spent on STEP-2, measure off 10" on the conveyor support. Place an object on the belt and note the travel time for the 10" measured distance.

A.) The display reads *STEP-2 TIME-?*. Enter the measured travel time for STEP-2. Min: 0 Max: 59:59 (min:sec). Press the PROG/ENTER key. Measured voltage at A1 and A2 should be 20 VDC.

B.) The display reads *STEP-2 DIST-?*. Enter 10". Press the PROG/ENTER key.

4. The display reads *MIN-TM ENTRY?* (the fastest belt speed). Limits of this value are determined by the Step-1 and Step-2 calibration values. See TABLE 4 for correct entry for this model. Press the PROG/ENTER key.
5. The display reads *MAX-TM ENTRY?* (slowest belt speed). Limits of this value are determined by the Step 1 and Step 2 calibration values. Use 1600 (16 min). Press the PROG/ENTER key.
6. The display flashes *DONE* and *SAVE*. Press the PROG/ENTER key to permanently store the calibration values in non-volatile memory (NOVRAM).

*NOTE: If any voltage adjustments were made hit the CLEAR key to abort the calibration mode. Reenter the calibration mode to verify that voltage is locked in.*

*NOTE: During these adjustments, pressing the clear button will abort all entries and require reprogramming of belt time mode. When exiting the Belt Speed Calibration Mode, enter a time. Otherwise the time defaults to zero and the oven will not heat, and the belt will not move.*

Oven Type	Belt Length/ Distance	Minimum Oven Entry	Oven Type	Belt Length/ Distance	Minimum Oven Entry
MT1828	28	330 (3 min, 30 sec)	MT3270	70	330 (3 min, 30 sec)
MT2136	36	200 (2 min)	MT3855	55	330 (3 min, 30 sec)
MT3240	40	300 (3 min, 00 sec)	MT3870	70	330 (3 min, 30 sec)
MT3255	55	300 (3 min, 00 sec)			

TABLE 4

## MOTOR CONTROL BOARD

### High/low speed motor control board adjustment for 180 and 130 volt DC motors

*NOTE: The motor control board is located on the slide out control panel.*

#### High Speed Motor Adjustment:

For closed loop systems follow Belt Speed Verification through STEP 5 (see page 3–6). For open loop systems follow Belt Speed Calibration through STEP 2 (see page 3–7).

1. With the motor connected (make no open circuit voltage readings) measure the voltage at the motor leads (A1 & A2 in FIGURE 4) on the DC control board. If the voltage is not within 3 VDC of the specified voltage continue with step 3.
2. Turn the MAX trim pot counter-clockwise to lower and clockwise to raise the voltage until it is within 3VDC of the specified voltage.

*NOTE: For closed loop systems this adjustment must be made quickly.*

#### Low Speed Motor Adjustment:

For closed loop systems the computer automatically proceeds to low speed. For open loop systems continue Belt Speed Calibration through STEP 3 (see page 3–7).

1. With the motor connected (make no open circuit voltage readings) measure the voltage at the motor leads on the DC control board (A1 & A2 in FIGURE 4). If the voltage is not 26VDC +/- 1 VDC, continue with step 3.
2. Turn the MIN SPEED pot clockwise to lower the voltage and counter-clockwise to raise the voltage.

*NOTE: If any voltage adjustments were made hit the CLEAR key to abort the calibration mode. Reenter the calibration mode to verify that voltage is locked in.*

COMPUTERIZED OVENS				
Model	130 Volt System		180 Volt System	
	Low	High	Low	High
MT1828	20	130	26	180
MT2136	20	130	26	180
MT3240	20	130	26	180
MT3270	26	130	26	180
MT3855	26	130	26	180
MT3870	26	130	26	130
NON-COMPUTERIZED OVENS				
MT2136	20	130	26	180
MT3255	26	130	26	180
MT3270	26	130	26	180
MG3270	26	130		
24 VDC SYSTEM				
MT1820	3.0	21		

TABLE 5

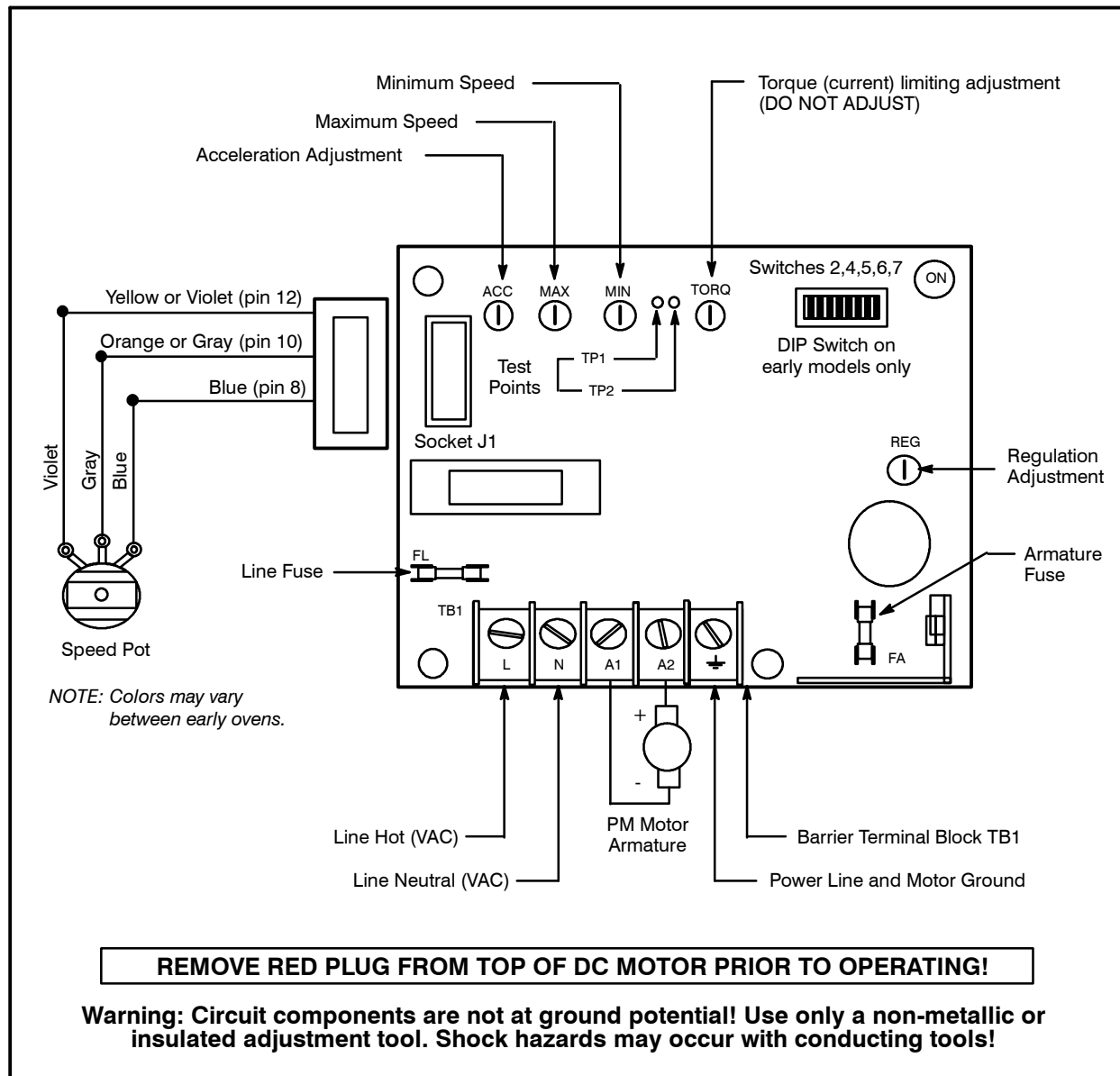


FIGURE 4

## CHAPTER 4

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# ***ENHANCEMENTS***

## BURNER

### NEW BURNER INSTALLATION

1. Disconnect the power to the oven. Shut off the main gas valve to the oven.
2. Disconnect the incoming gas line to the oven.
3. Remove the two screws securing the control box cover. Remove the control box cover.
4. Some ovens have a lower panel below the control box cover containing two fuses. If so, remove this panel. Disconnect the fuses. Note the way the fuses are wired. They will need to be rewired the same way when reconnecting them.
5. Remove the chain guard.
6. Remove the bracket securing the external gas piping on the back of the oven.
7. Remove the external gas valve assembly at the elbow on the back of the oven. See FIGURE 2.
8. Open the union on the gas stack if applicable. This will disconnect the burner from the gas stack.
9. Disconnect the burner blower pressure sense tube from the burner and pressure switch. Discard.
10. Disconnect the burner blower wires, igniter wire and flame sense wire.
11. Loosen the three 1/4"-20 screws securing the burner assembly to the burner support. Remove the burner assembly and all remaining gas piping.
12. Remove the red and white wires from the burner valve and ignition control. Install the wires on the burner valve of the new gas stack.
13. Remove the four 1/4"-20 nuts and washers securing the conveyor drive motor bracket to the control box floor. Remove the drive motor.
14. Remove the ignition control from the control plate. Install the new ignition control module as follows:
  - A.) Mount the new ignition control to the control plate in place of the old one. The control terminals (not ground) should be oriented up.
  - B.) Transfer the yellow wire from ground on the old ignition control to ground on the new ignition control.
  - C.) Transfer the wire from THS2 on the old ignition control to THS2 on the new ignition control.
  - D.) Remove the black and yellow wires connected to L1 on the old ignition control. Replace with the black wire provided to connect the transformer to the relay.

*NOTE: Refer to the new wiring diagram.*

15. Install the new probes as follows:

*NOTE: Refer to FIGURE 1 for correct probe locations.*

- A.) Slide the high limit and RTD probes out of the probe hole. Separate the two probes. Set aside the 6" RTD probe.
- B.) Install the high limit probe well in the location indicated in FIGURE 1. If there is no hole for the probe well, drill a .38 dia. hole through the body side and inner liner at the correct location.

*NOTE: Be sure to drill the hole as level as possible. Deburr the hole and remove the drill chips from the inside of the control box. Drill chips will damage wires.*

- C.) Insert the high limit probe well into the hole. Attach the mounting bracket to the body side with the self drilling screws provided.

*NOTE: It may be helpful to drill a small pilot hole to start the self drilling screws.*

- D.) Insert the high limit probe into the well all the way.
- E.) Put a small dab of silicone on the probe well opening to secure the high limit probe.
- F.) Install the new RTD probe into the location indicated. Find the leads from the old probe. Disconnect the leads from the wiring harness. Connect the leads from the new probe to the harness.

*NOTE: The probe bracket may not sit flush against the oven side due to interference with the burner support assembly. If so, use the shim provided.*

16. Reinstall the drive motor.
17. Place the attention plate as close to the existing rating plate as possible. Drill two 1/8" diameter holes and mount the plate using the 1/8" rivets supplied.
18. Separate the union on the new gas stack and burner assembly.
19. Slide the new burner assembly into the burner support until the blower mounting flange is 5.6" from the back wall of the control box. **Be sure the burner assembly is level and straight.** Se-



- cure the burner assembly to the burner support by tightening the three 1/4"-20 screws.
20. Reattach the union between the gas stack and the new burner assembly. the nipple should extend through the hole in the side of the control box.
  21. Connect and seal the gas stack to the external gas piping assembly. Use pipe joint compound resistant to LP gases.
  22. Reinstall the piping support bracket.
  23. Connect the flame sense wire to the ignition control (sense 4). Refer to FIGURE 3.
  24. Attach the spark wire to the ignition control.
  25. Reconnect the burner blower pressure sense port on the side of the new burner to the pressure switch using the tubing provided.
  26. Connect the new burner blower wires.  
*NOTE: On some units it may be necessary to use the 1/4 male terminals provided.*
  27. Connect the burner valve as follows:
    - A.) Connect the red wire from the burner valve to MV3 on the ignition control.
    - B.) Connect the white wire from the burner valve to the ground on the ignition control.
  28. Replace any existing schematic diagrams with the new ones provided. Schematics are provided for both integral control and remote control ovens. Be sure to use only those appropriate for the oven being upgraded. Discard the inapplicable schematics.
  29. Install the new chain guard onto the chain guard bracket using the #10 pan head screws, washers and lockwashers provided. Mount the chain guard to the floor of the control box reusing the hardware from the old chain guard. Refer to FIGURE 4.
  30. If there was a lower panel with fuses below the control box door, replace it with the new panel provided. Move the fuses to the new panel. Rewire the fuses exactly as they were.
  31. Reconnect the power to the oven.
  32. Cycle the oven on to ensure all systems are working properly, particularly the burner blower and drive motor.
  33. Reconnect the incoming gas line. Turn on main gas valve and check all fittings for leaks using proper leak checking procedures.
  34. Reinstall the control box cover.
  35. Perform a temperature calibration on the oven.

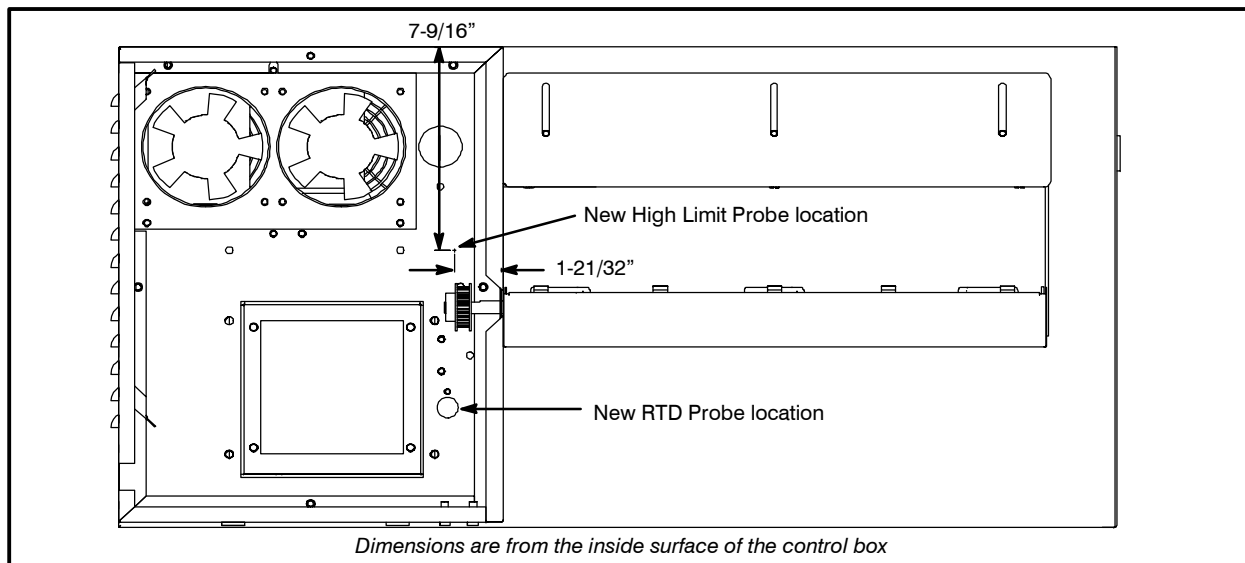


FIGURE 1

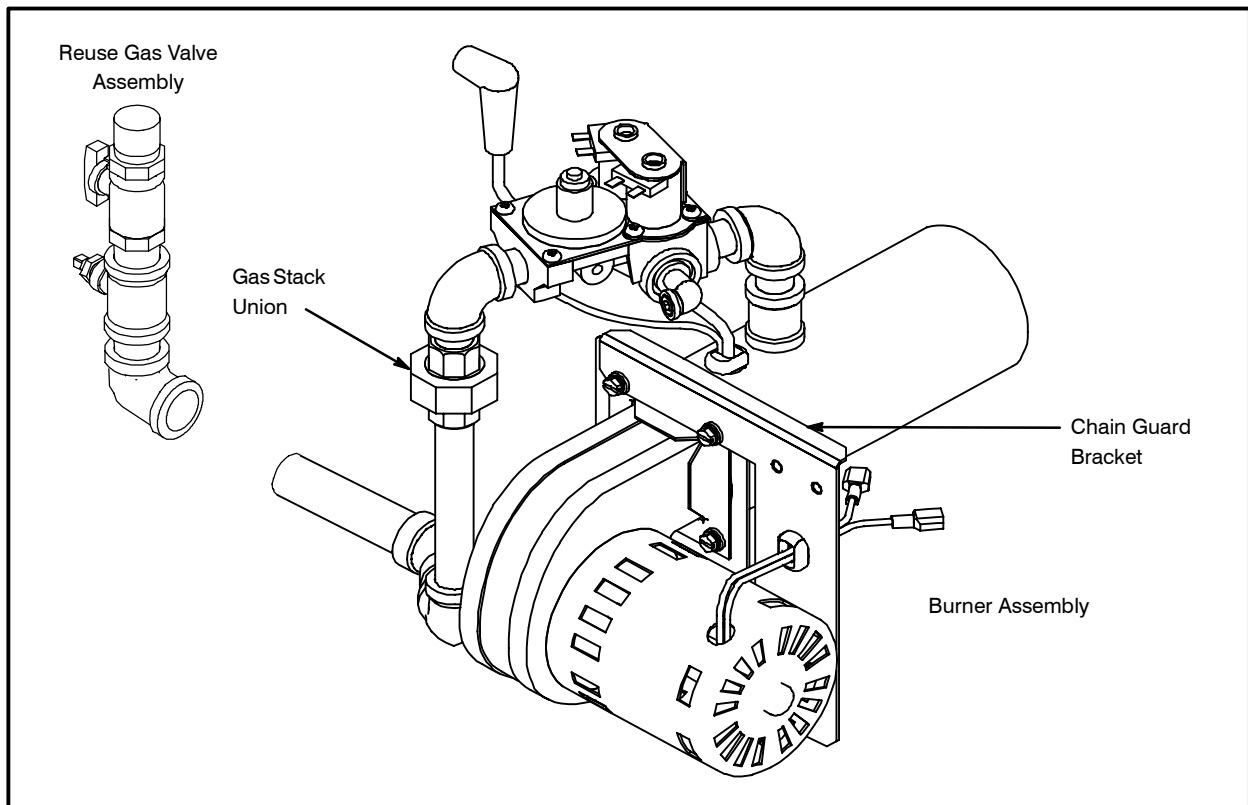


FIGURE 2

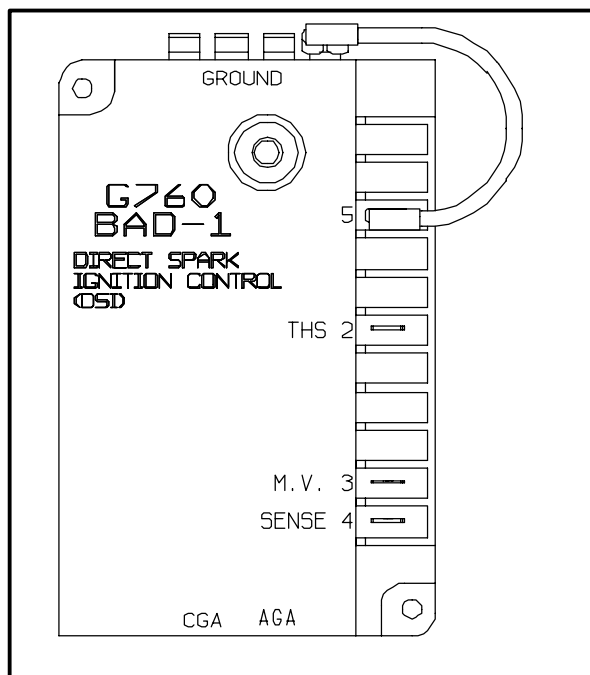


FIGURE 3

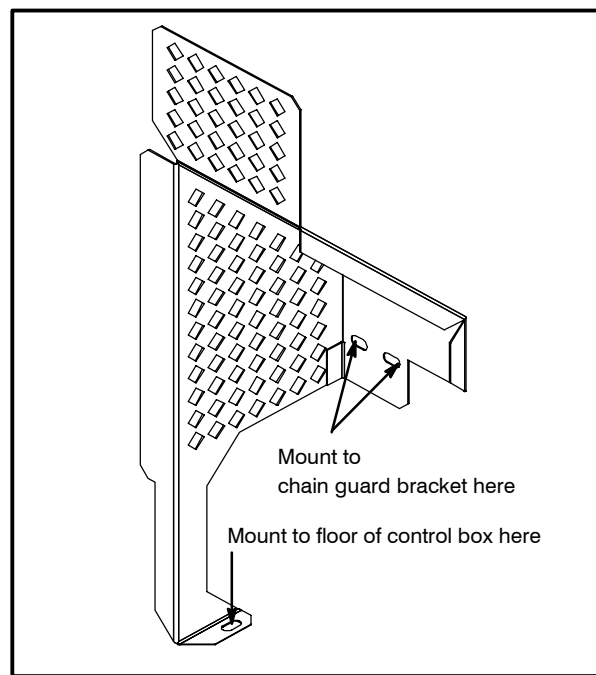


FIGURE 4

## IGNITER AND FLAME RODS

FIGURE 5 illustrates the correct location of the igniter and flame rod.

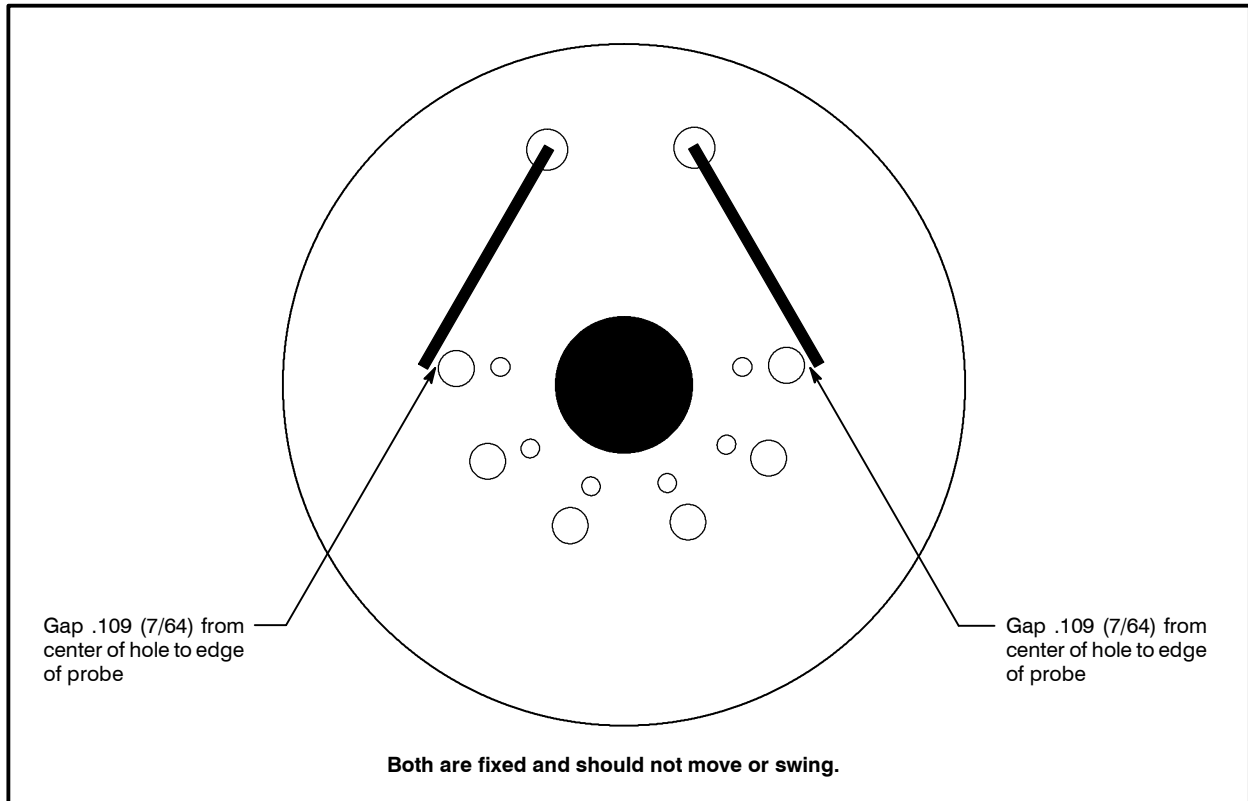


FIGURE 5

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## *CHAPTER 5*

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# ***TROUBLESHOOTING***

## DC DRIVE SYSTEM

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
<b>Symptom #1 – Conveyor Belt will not run</b>	
<ul style="list-style-type: none"> <li>• Oven in OFF mode.</li> <li>• Loose computer controller cord connection.</li> <li>• Time not programmed into computer.</li> <li>• Emergency stop switch on OFF.</li> <li>• Control circuit breaker tripped.</li> <li>• Belt hooked on something in oven.</li> <li>• 5 amp line fuse blown.</li> <li>• 200 milliamp armature fuse blown.</li> <li>• Hall Effect Pickup not connected. (<i>Closed loop systems only</i>)</li> <li>• Motor brushes worn out.</li> <li>• Defective conveyor drive motor.</li> <li>• Defective conveyor drive motor controller.</li> <li>• Wire from pickup open or faulty connection.</li> </ul>	<ul style="list-style-type: none"> <li>• Turn to ON position.</li> <li>• Adjust and retighten cables and set screws.</li> <li>• Program in a cook time. See Operation Section (page 2–2).</li> <li>• Pull switch out to ON.</li> <li>• Reset breaker.</li> <li>• Turn oven OFF, unhook and repair problem.</li> <li>• Replace fuse. Determine amp draw.</li> <li>• Replace fuse. Determine amp draw.</li> <li>• Verify the unit is set for a single pulse pickup. If not, reset for a single pulse pickup. If yes reattach the pickup.</li> <li>• Replace brushes.</li> <li>• Replace conveyor drive motor.</li> <li>• Replace conveyor drive motor controller.</li> <li>• Repair or replace wire.</li> </ul>
<b>Symptom #2 – Computer error code MOTOR - SPEED - ERROR</b>	
<ul style="list-style-type: none"> <li>• Belt speed needs calibration.</li> </ul>	<ul style="list-style-type: none"> <li>• See Technical Appendix (page 3–6).</li> </ul>
<ul style="list-style-type: none"> <li>• Voltage from Bodine controller to DAC not present. The DAC (Digital Analog Control) is a non-repairable component of the computer. There should be approximately 20 VDC between the red and green wires on the 3 pin connection of the DC drive board.</li> </ul>	<ul style="list-style-type: none"> <li>• Replace the drive motor controller.</li> </ul>
<ul style="list-style-type: none"> <li>• DAC voltage is present but not regulated between 4.7 and .47 VDC when different times are programmed into the cooking computer. Measure the voltage between the green and blue wires of the 3 pin connection.</li> </ul>	<ul style="list-style-type: none"> <li>• Replace 9 pin computer cable</li> <li>• Replace the computer.</li> </ul>

## COMPUTER CONTROL SYSTEM

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
<b>Symptom #1 – Computer controller displays: PROBE - OPEN - PROBE - SHORT and alarm buzzer sounds</b>	
<ul style="list-style-type: none"> <li>• Internal problem with computer controller.</li> <li>• Loose connections at computer controller.</li> <li>• Shorted or open RTD probe.</li> </ul>	<ul style="list-style-type: none"> <li>• Verify display integ. in the 2nd level programming. If the controller has been programmed the computer may need to be replaced.</li> <li>• Tighten connections.</li> <li>• Use the chart in the Technical Appendix (page NO TAG) to determine if probe is bad. Replace if necessary.</li> </ul>
<b>Symptom #2 – Computer controller displays: ERROR - HIGH - TEMP - LIMIT</b>	
<ul style="list-style-type: none"> <li>• Actual temperature exceeds programmed limit value. Default 605°F (319°C).</li> <li>• Internal problem with computer controller.</li> </ul>	<ul style="list-style-type: none"> <li>• Faulty burner valve relay. Replace relay.</li> <li>• Faulty computer cables</li> <li>• Verify display integ. in the 2nd level programming. If the controller has been programmed the computer may need to be replaced.</li> </ul>
<b>Symptom #3 – Computer controller displays: MTR-SPD</b>	
<ul style="list-style-type: none"> <li>• Motor speed does not match set point.</li> <li>• Motor indicated that the computer is not receiving a signal from the pickup.</li> </ul>	<ul style="list-style-type: none"> <li>• Recalibrate the motor speed. See Calibration and Adjustment (page 3–8).</li> <li>• Fuses on the control board may have blown. Check and replace if needed.</li> <li>• Wires from the pickup are not connected or broken. Connect or replace.</li> </ul>

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**HEATING SYSTEM**

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
<b>Symptom #1 – Burner will not fire</b>	
<ul style="list-style-type: none"> <li>• Oven in OFF mode.</li> <li>• Emergency stop switch on OFF.</li> <li>• Control circuit breaker tripped.</li> <li>• Combustion motor not running.</li> </ul> <ul style="list-style-type: none"> <li>• Main Temperature Controller not set above ambient temperature.</li> <li>• Manual gas valve closed.</li> <li>• Intermittent Ignition Device (IID) system locked out.</li> <li>• Air pressure switch may be open.</li> <li>• Blower motor(s) not running.</li> <li>• High Limit control tripped.</li> </ul> <ul style="list-style-type: none"> <li>• Thermal switch in control compartment tripped.</li> <li>• Excessive intake air temperature.</li> <li>• Heat relay defective.</li> </ul> <p><b>MT1828G CE approved units</b></p> <ul style="list-style-type: none"> <li>• Prepurge timers defective.</li> <li>• Triple pole double pole relay defective.</li> <li>• Gas valve defective.</li> </ul> <p><b>MT1828E only</b></p> <ul style="list-style-type: none"> <li>• Contactor coil powered but will not close.</li> <li>• Elements open.</li> </ul>	<ul style="list-style-type: none"> <li>• Turn to ON position.</li> <li>• Pull switch out to ON.</li> <li>• Reset breaker.</li> <li>• Check transformer for primary and secondary voltage.</li> <li>• Check main control and burner valve relays to see if closed.</li> <li>• Check relay in combustion burner box. If bad replace relay.</li> <li>• Set to desired temperature.</li> <li>• Open valve.</li> <li>• Reference Technical Appendix (page NO TAG through NO TAG).</li> <li>• Check convection blower (or 4 convection fans) for proper operation.</li> <li>• Verify voltage to motor. If voltage is present, replace the motor or start capacitor.</li> <li>• Verify that 625°F (330°C) high limit is programmed into the controller. If so reset the high limit. Set the computer to 500°F (260°C). Use a pyrometer to verify the oven temperature. If the oven climbs significantly above the setpoint, use the chart in the Technical Appendix (page NO TAG) to check the probe. If the probe is alright the computer may need replacement.</li> <li>• Check hood system.</li> <li>• Check hood system.</li> <li>• Replace heat relay.</li> <li>• Replace timers.</li> <li>• Replace relay.</li> <li>• Replace gas valve.</li> <li>• Bad contactor, replace.</li> <li>• Replace elements.</li> </ul>

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POSSIBLE CAUSE(S)	SUGGESTED REMEDY
<b>Symptom #2 – Oven will not reach desired temperature</b>	
<ul style="list-style-type: none"> <li>• Gas pressure to oven is too low.</li> <li>• Top air plates missing.</li> <li>• Faulty RTD probe.</li> <li>• Blower motor(s) running backward.</li> <li>• Controller out of calibration.</li> <li>• Excessive food/debris accumulation blocking the airflow.</li> </ul>	<ul style="list-style-type: none"> <li>• Contact local gas representatives.</li> <li>• Install air plates.</li> <li>• Use the chart in the Technical Appendix (page NO TAG) to determine if probe is bad. Replace if necessary.</li> <li>• Verify voltage to motor. If voltage is present, replace the motor or start capacitor.</li> <li>• Recalibrate the controller. See Calibration and Adjustment (page 3–5).</li> <li>• The inside of the oven should be cleaned to remove any materials that could have dropped off the conveyor belt and possibly blocked some of the air flow holes. This would include the removal of the conveyor belt, conveyor belt supports, and the nozzles. The oven interior and all parts removed should then be cleaned with an appropriate oven cleaner safe for aluminum.</li> </ul>
<b>Symptom #3 – Burner operates sporadically</b>	
<ul style="list-style-type: none"> <li>• Air pressure switch may be open. General export and CE approved ovens only.</li> <li>• Thermal switch tripped.</li> <li>• Faulty RTD probe.</li> <li>• Excessive food/debris accumulation blocking the airflow.</li> </ul>	<ul style="list-style-type: none"> <li>• Check convection blower (or 2 convection fans) for proper operation.</li> <li>• Determine the ambient temperature in the control compartment. If above 140°F (60°C) check the cooling fan operation.</li> <li>• Use the chart in the Technical Appendix (page NO TAG) to determine if probe is bad. Replace if necessary.</li> <li>• The inside of the oven should be cleaned to remove any materials that could have dropped off the conveyor belt and possibly blocked some of the air flow holes. This would include the removal of the conveyor belt, conveyor belt supports, and the nozzles. The oven interior and all parts removed should then be cleaned with an appropriate oven cleaner safe for aluminum.</li> </ul>

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**CONVECTION SYSTEM**

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
<b>Symptom #1 – Blower motor(s) not running</b>	
<ul style="list-style-type: none"> <li>• Oven in OFF mode.</li> <li>• Remote emergency stop switch on OFF.</li> <li>• No power to oven.</li> <li>• Motor circuit breaker tripped.</li> <li>• Faulty start capacitor.</li> <li>• Motor(s) burnt out.</li> <li>• Motor contactor open.</li> <li>• Thermal overload tripped.</li> </ul>	<ul style="list-style-type: none"> <li>• Press ON/OFF key.</li> <li>• Pull switch out to ON.</li> <li>• Verify power to motor(s). If there is voltage present, replace the motor. If voltage is not present, check the motor contactor.</li> <li>• Replace fuse. Determine amp draw.</li> <li>• Replace capacitor.</li> <li>• Check draw (3amps or greater) when the oven is cold.</li> <li>• Check that the computer is turned on and that a cook time and temperature have been programmed. Check for voltage to the coil of the motor contactor. If voltage is present, replace the contactor. If voltage is not present, check that the blower relay is closed. If not, check for voltage at the blower relay coil. If a 12 VDC voltage is present at the coil the blower relay is bad. If there is no voltage present at the coil the computer may need to be replaced.</li> <li>• Determine if the cooling blower (or fans) are operating. If not, verify voltage to the cooling blower. If voltage is present, replace the cooling blower motor. If voltage is not present, verify voltage through the thermal switch. If no voltage is present, replace the thermal switch.</li> </ul>
<b>Symptom #2 – Blower motor(s) do not shut off</b>	
<ul style="list-style-type: none"> <li>• Faulty motor contactor.</li> <li>• Faulty blower motor relay.</li> <li>• Faulty auxiliary contact.</li> <li>• Faulty probe.</li> </ul>	<ul style="list-style-type: none"> <li>• Replace contactor.</li> <li>• Replace relay.</li> <li>• Replace auxiliary contactor.</li> <li>• Use the chart in the Technical Appendix (page NO TAG) to determine if probe is bad. Replace if necessary.</li> </ul>
<b>Symptom #3 – Hood system does not operate when oven is on</b>	
<ul style="list-style-type: none"> <li>• Fan exhaust/supply problem.</li> <li>• Defective interlock circuit.</li> </ul>	<ul style="list-style-type: none"> <li>• Contact HVAC service.</li> <li>• Replace auxiliary contactor.</li> </ul>

POSSIBLE CAUSE(S)	SUGGESTED REMEDY
<b>Symptom #36 – Blower motor running backward</b>	
<ul style="list-style-type: none"> <li>• Motor off by thermal overload (other fans forcing blower to spin).</li> <li>• Faulty capacitor.</li> </ul>	<ul style="list-style-type: none"> <li>• Determine if the cooling blower (or fans) are operating. If not, verify voltage to the cooling blower. If voltage is present, replace the cooling blower motor. If voltage is not present, verify voltage through the thermal switch. If no voltage is present, replace the thermal switch.</li> <li>• Replace capacitor.</li> </ul>
<b>Symptom #37 – Blower motor does not shut off</b>	
<ul style="list-style-type: none"> <li>• Bad temperature probe</li> <li>• Bad blower relay</li> <li>• Faulty computer</li> </ul>	<ul style="list-style-type: none"> <li>• Check the resistance values of the temperature probe for values from 135-170°F (57-77°C). Reference NO TAG on page NO TAG of the Technical Appendix. If the values do not agree with the chart change the probe.</li> <li>• If the temperature probe is good check for voltage at the coil of the blower relay. If voltage is not present the relay is bad. Replace the blower relay.</li> <li>• If voltage is present at the blower relay, the computer is bad. Replace the computer.</li> </ul>